

Pivotal®

Pivotal Cloud Foundry Overview



오충현(coh@pivotal.io) / Senior Solutions Architect

A photograph of a group of people in a modern office or workshop environment. On the left, a man stands and writes on a whiteboard. In the center, a group of four people sit around a table, looking towards the right. On the right, a man stands and looks towards the group. The background shows office equipment and a window. Two teal-colored rectangular boxes are overlaid on the image, one above the seated group and one below it.

플랫폼(Platform) as a Service?

플랫폼이란?

비즈니스 플랫폼

비즈니스 플랫폼은 외부 생산자와 소비자가 상호작용을 하면서 가치를 창출할 수 있게 해주는 것에 기반을 둔 비즈니스이다. 플랫폼은 이러한 상호작용이 일어날 수 있도록 참여를 독려하는 개방적인 인프라를 제공하고 그에 맞는 거버넌스를 구축
예) 우버, 카카오택시,..

서비스 플랫폼

서비스 플랫폼은 다른 서비스들이 나의 서비스 기능을 쉽게 사용할 수 있게 해주는 인터넷 기반의 기술 환경.
예) OpenAPI: 페이스북, 트위터, Linked In, MAP API

소프트웨어 플랫폼

소프트웨어에서는 플랫폼이 여러가지 기능들을 제공해주는 공통 실행 환경을 일컫는 용어
예) Java Platform, Unix Platform, 웹 개발 플랫폼

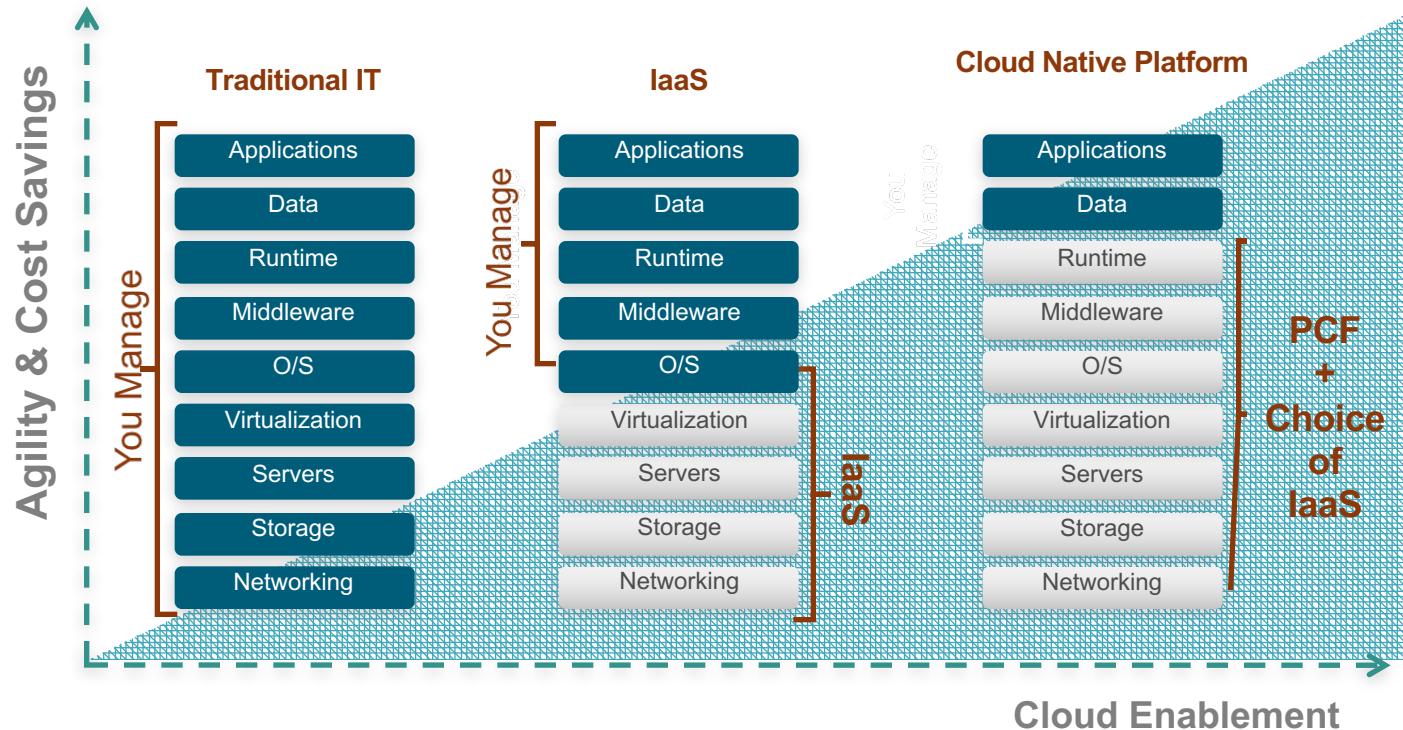
하드웨어 플랫폼

하드웨어에서 플랫폼이란 표준 공정을 통해 다양한 제품을 만들어내는 기반이자 도구를 지칭.
예) '현대 소나타'와 '기아 K5'가 플랫폼을 공유, 플랫폼에는 엔진, 조향장치 외에도 품질검수 및 부품의 표준규격 등도 함께 포함

Platform as a Service(PaaS)

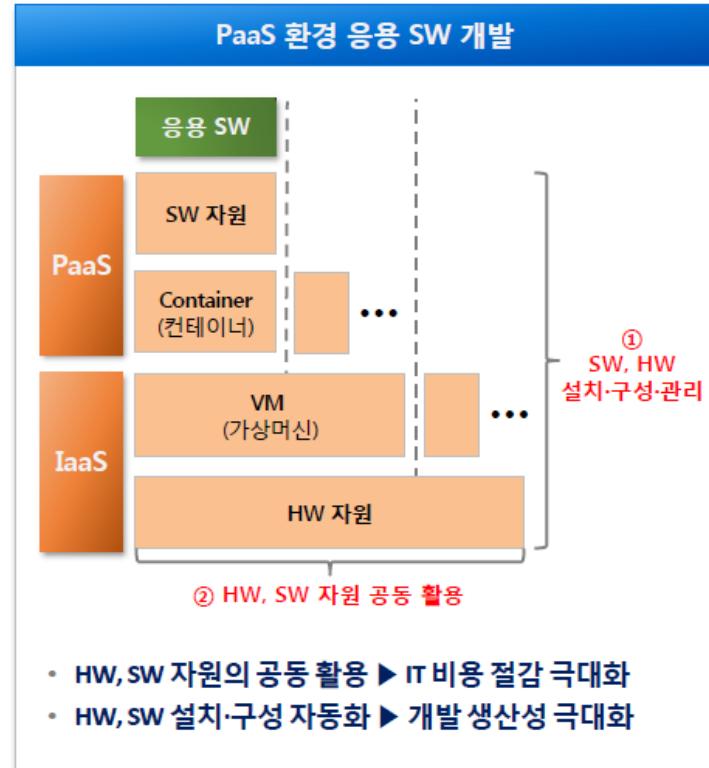
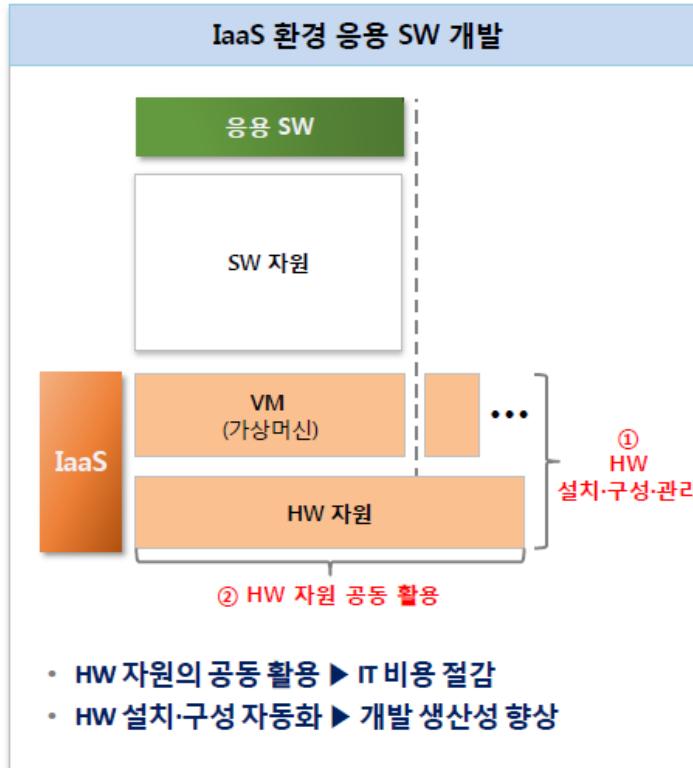
“PaaS는 개발자를 위한 일련의 서비스로,
개발자들이 기반 인프라스트럭처에 대해 신경
쓰지 않고 앱을 개발하고 테스트하는 환경”

플랫폼 제공범위



클라우드 플랫폼 효율성

클라우드 플랫폼(PaaS) 기술을 통한 [HW 및 SW 자원의 효율적인 관리]



IaaS .vs. PaaS : 애플리케이션 배포

IaaS

- Provision a VM
- Install Application Runtime
- Deploy Application
- Configure Load Balancer
- Configure SSL Termination
- Service Connectivity
- Configure Firewall

Pivotal Cloud Foundry

- `cf create-service`
- `cf push`
- `cf bind-service`

Common application needs *handled by the platform*

You can focus on *business value*

IaaS .vs. PaaS : 애플리케이션 확장

IaaS

- Provision a VM
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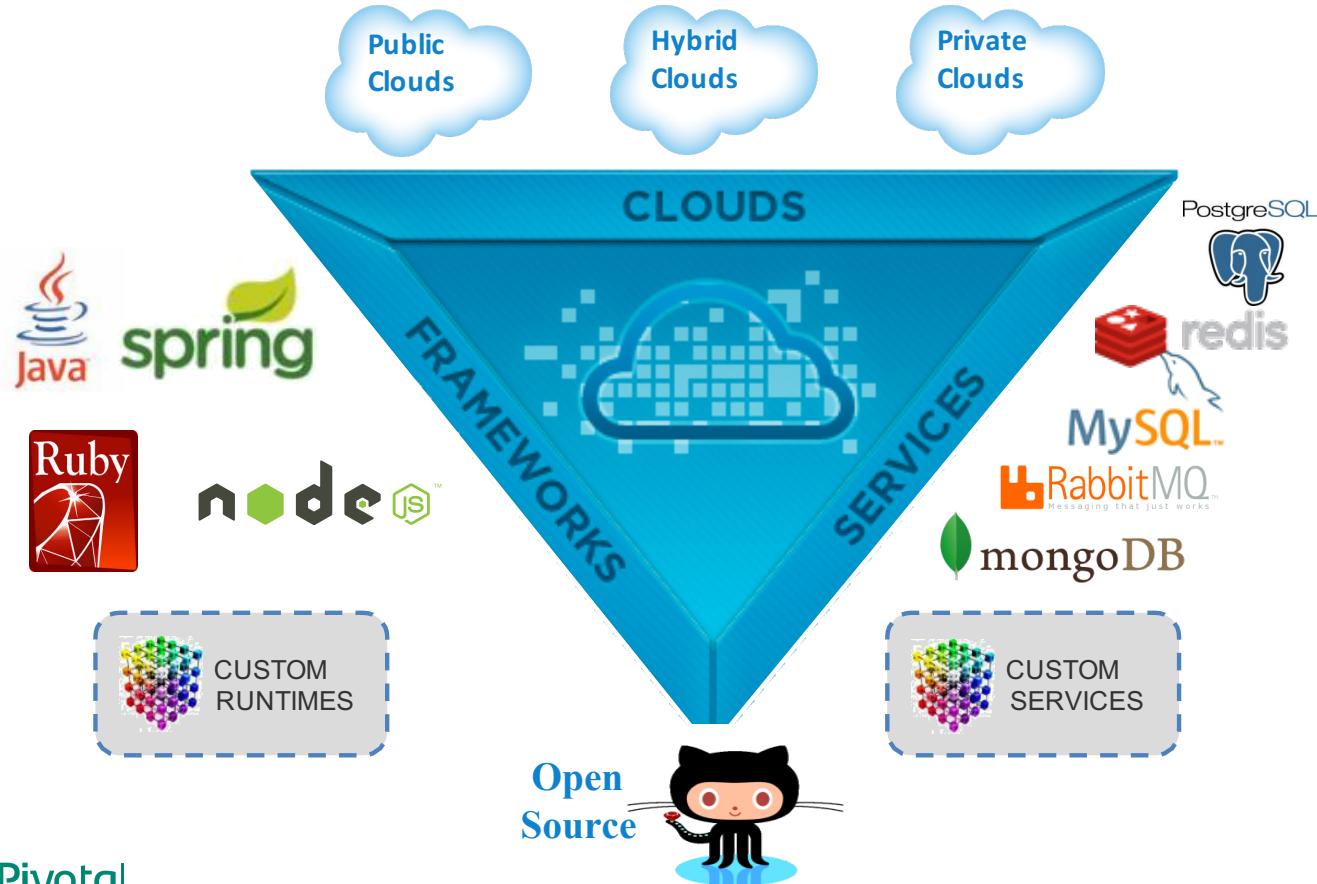
Pivotal Cloud Foundry

- `cf scale`
- Or bind to auto-scaling service

A photograph of a workshop or meeting room. On the left, a man in a grey t-shirt and dark shorts stands writing on a whiteboard with a marker. In the center, three people are seated at a table, looking towards the right. On the right, two more people are standing; one is leaning forward, gesturing with his hands, while the other stands with arms crossed. The room has a modern feel with exposed ceiling infrastructure.

Cloud Foundry

Cloud Foundry – Then Open PaaS



- ✓ Open Source
 - Reduce vendor-lock
- ✓ Public OR Private OR Hybrid
- ✓ Language Independence
 - Via Buildpacks
- ✓ Wide, growing range of services

Cloud Foundry – Foundation

PLATINUM



GOLD



SILVER



JPMORGAN CHASE & CO.



resilient scale



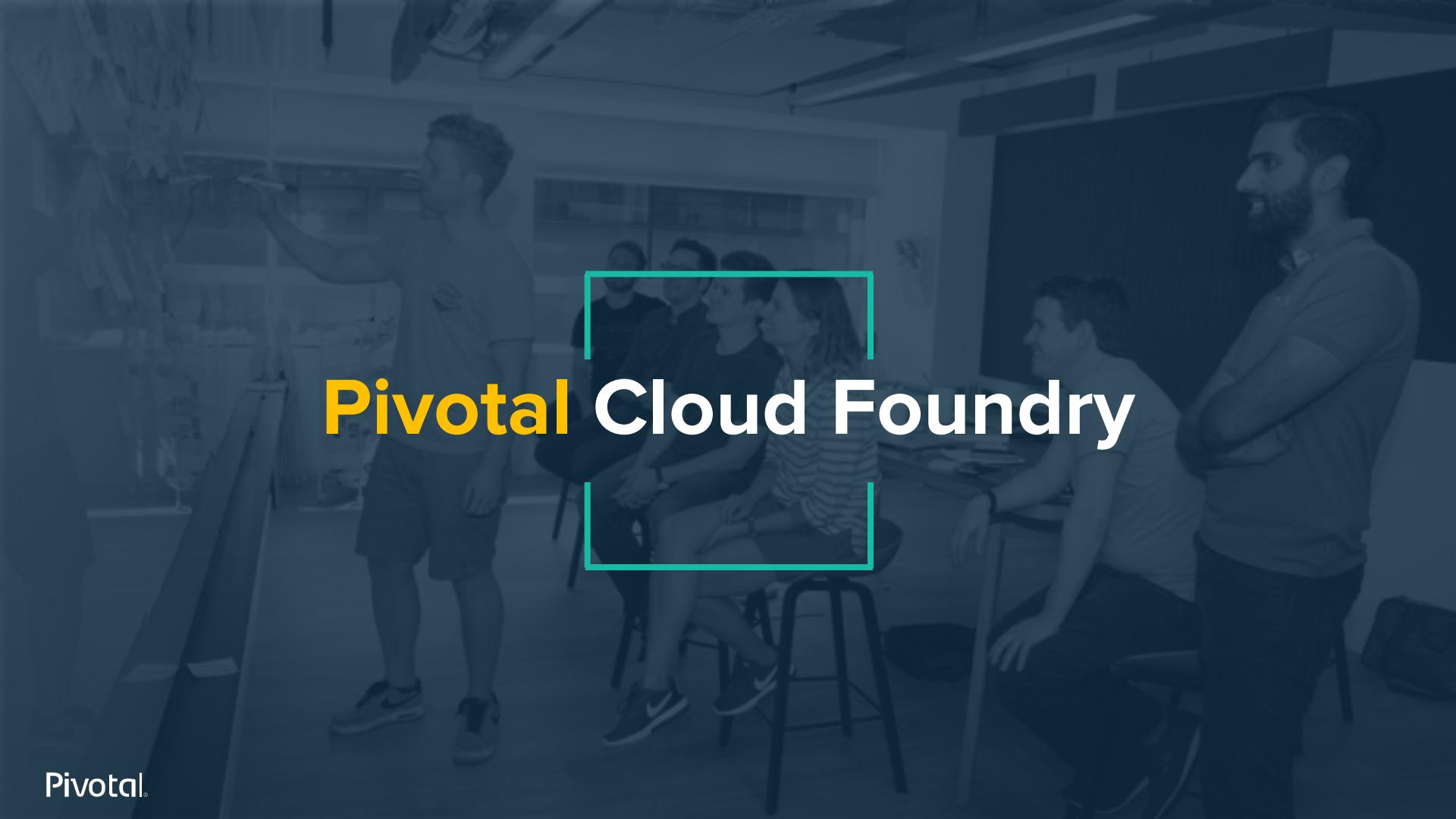
TOSHIBA

Cloud Foundry – 구축 사례

- Largest Chinese Internet search site
 - *One billion* page views per day
 - Ad-Words facility powered by Cloud Foundry



百科 文库 [hao123](#) | [更多>>](#)

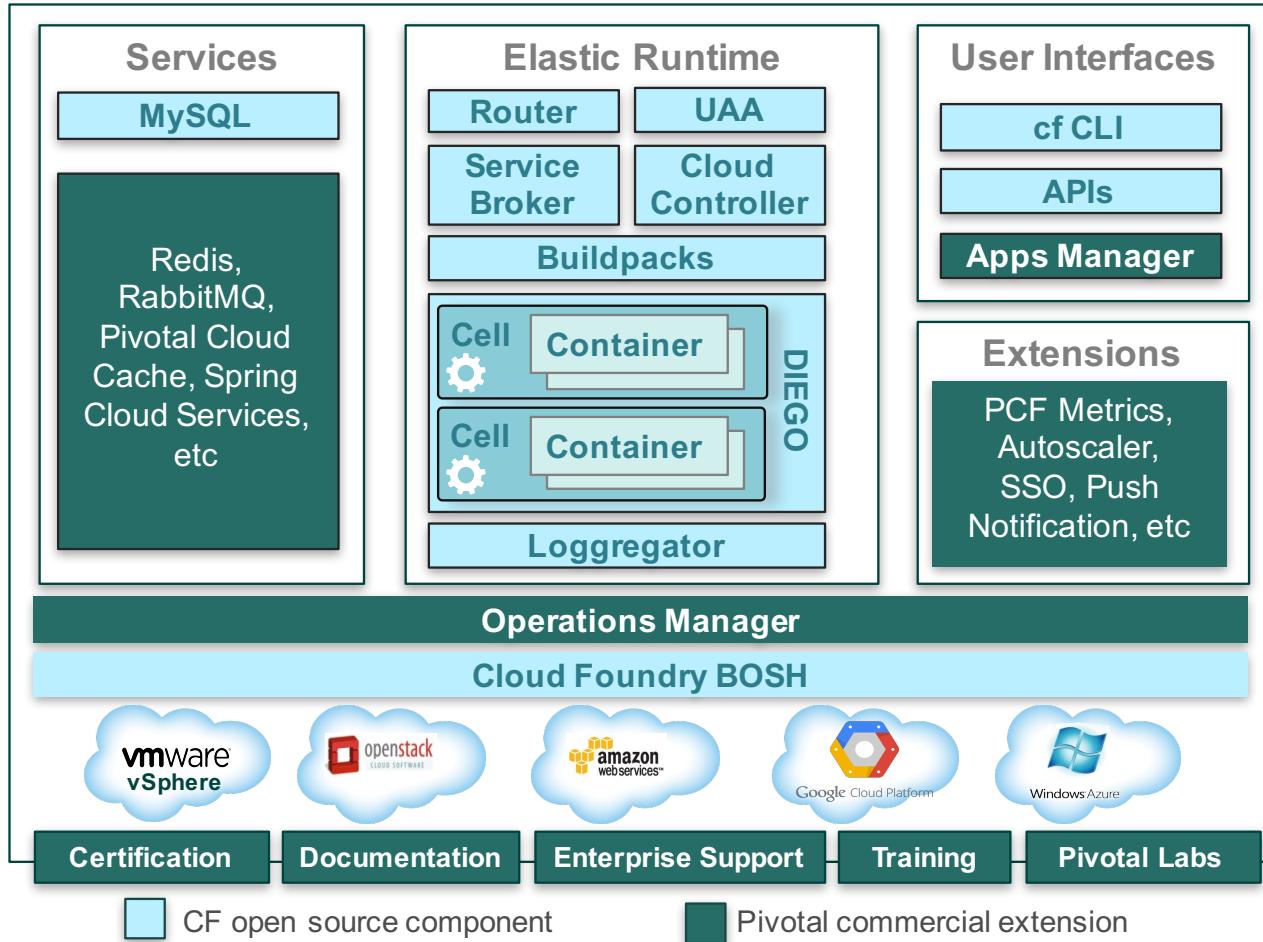
A photograph of a professional office environment. In the foreground, a man stands on the left, facing a whiteboard and writing with a marker. Another man stands to his right, pointing towards the whiteboard. In the center, three people are seated on chairs, looking towards the whiteboard. On the far right, a man stands with his arms crossed, also looking towards the whiteboard. The background shows office cubicles and equipment.

Pivotal Cloud Foundry

Pivotal Cloud Foundry

“클라우드 네이티브 앱을 위한
최적의 플랫폼”

PCF Architecture



Cloud Foundry 제품



- Open Source
- Setup and run a PaaS for yourself
- No paid support
- No tools

- Pivotal Web Services
- Public CF PaaS run/managed by Pivotal
- Hosted on AWS
- No guaranteed SLAs, not for production
- Support offered

- Commercial product
- Run private PaaS in-house, or
- Create public PaaS (ISP managed)
- Sophisticated Web Console (App Mgr)
- Additional Tools (Ops Mgr)
- Support offered

Core Tenets of PCF

Radically Simple, Developer Friendly

- Push an app – “it just works”
- Supporting wide ranging use cases
- Support new application patterns – microservices
- Easy to add/customize

Broad Ecosystem of Services

Data Services

App Services

Mobile Services

Operational Benefits for every Application

- Highly scalable
- Self healing
- Logging & audit trail
- Existing enterprise policies – user access & authorization
- Application monitoring
- Operational metrics
- App uptime SLAs

Deploy, Operate Update, Scale Platform on Any IaaS

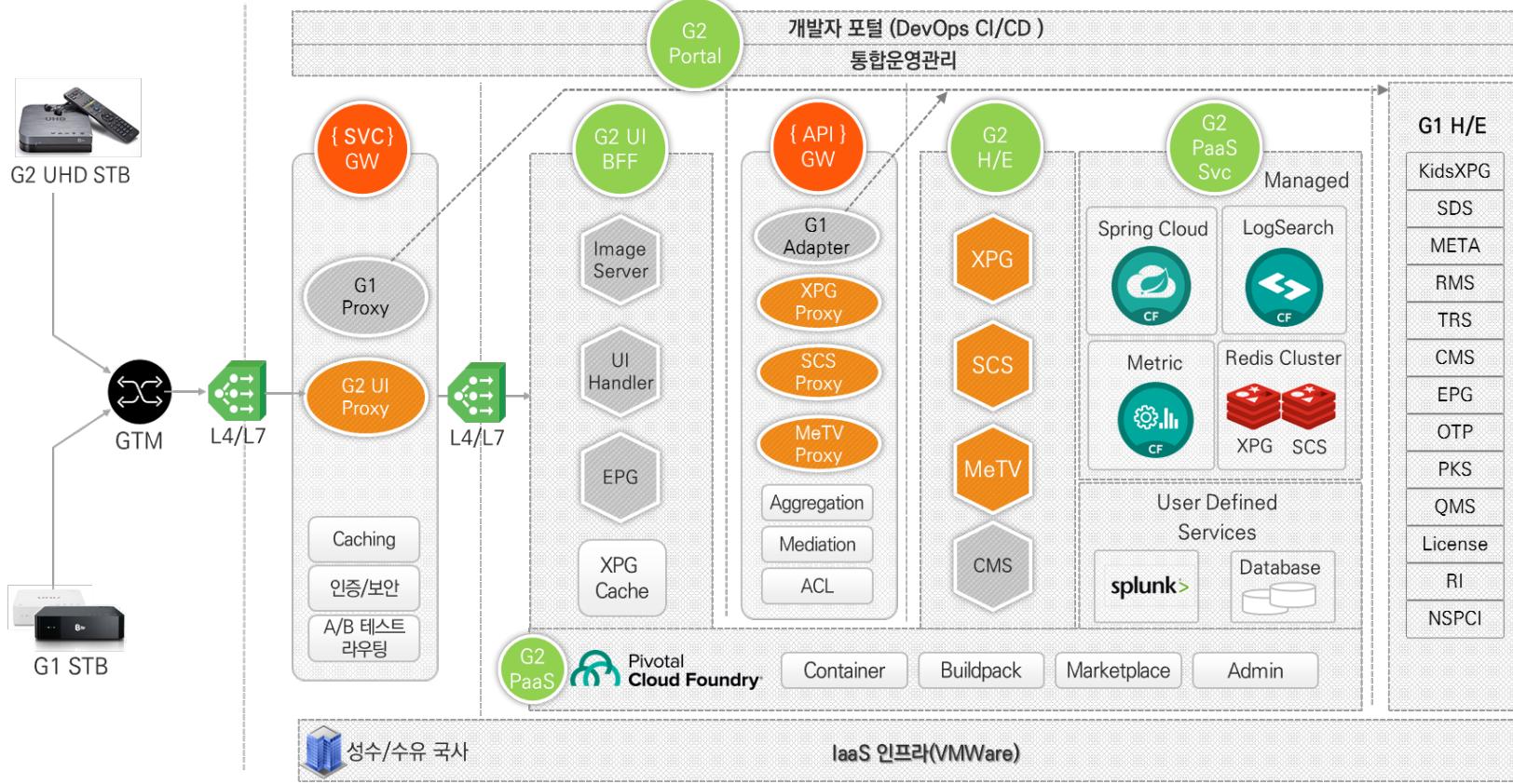
A photograph of a workshop or meeting room. In the foreground, a man stands on the left, writing on a whiteboard with a marker. On the right, another man with a beard stands with his arms crossed, looking towards the center. In the middle ground, three people are seated at a table, looking towards the left. The background shows shelves and office equipment.

LAB #1: Simple Web push

A photograph of a workshop or meeting room. In the foreground, a man stands on the left, writing on a whiteboard with a marker. On the right, another man with a beard stands with his arms crossed. In the center, three people are seated at a table, looking towards the left. The background shows shelves and office equipment.

PCF Customer-0 구성

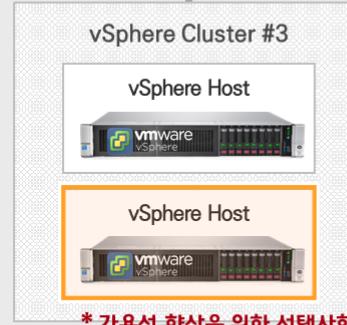
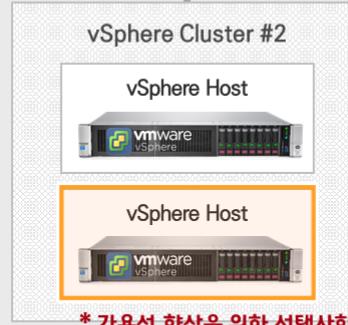
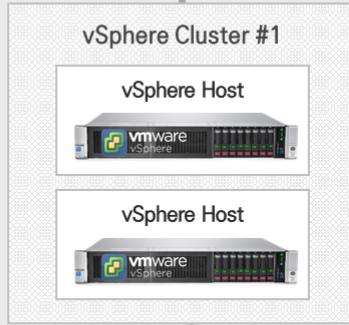
G 시스템 아키텍처



G 시스템 H/W 구성

각 국사 1 Set * 2

Load Balancer
(L4 또는 NSX)



항목	vSphere Host H/W Spec
CPU	속도: 2.50GHz 이상 소켓 : 2 소켓당 Core: 12 Core 이상
RAM	512 Gb 이상
내장 Disk	300Gb * 2

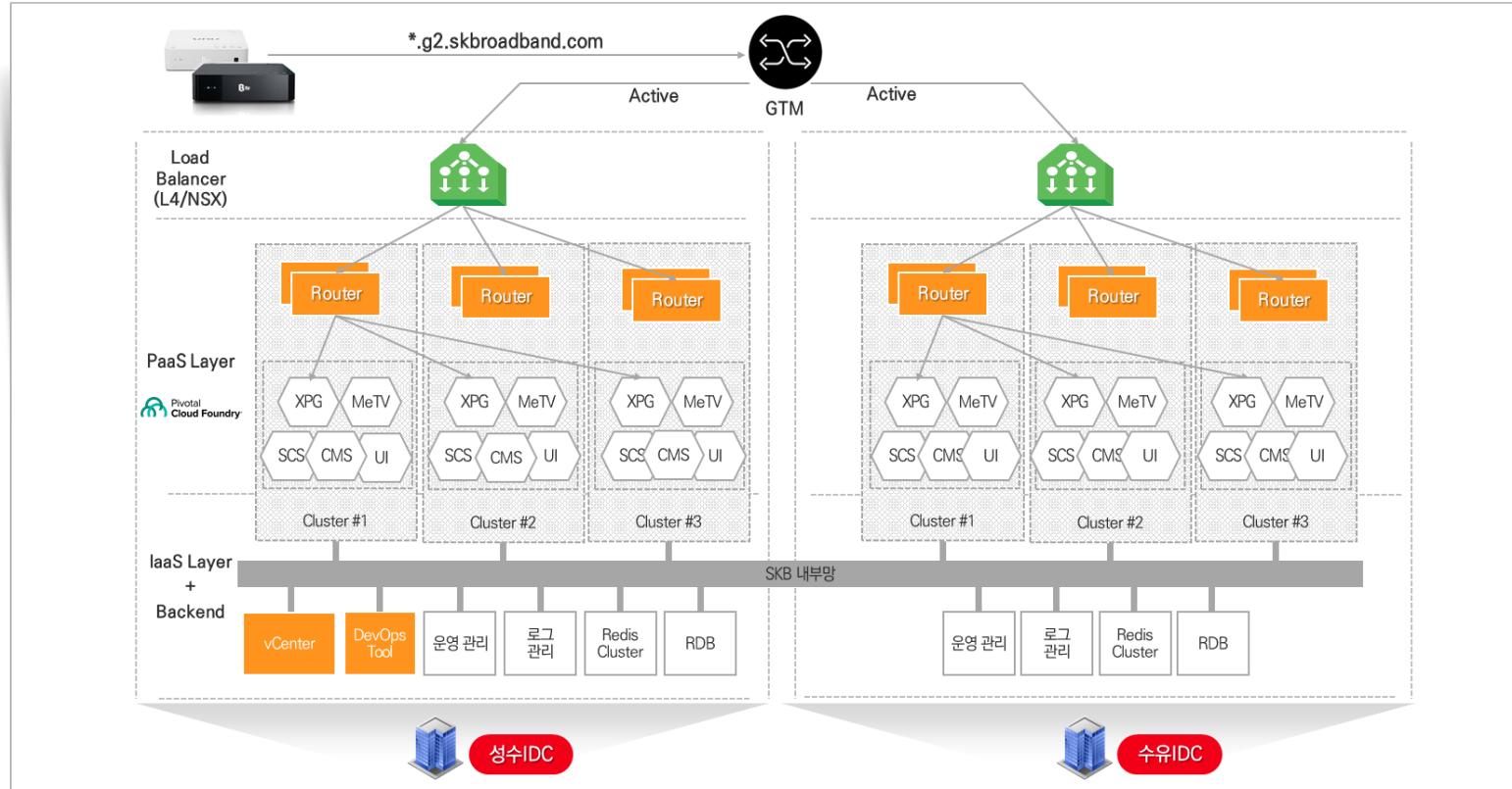


항목	NAS Storage H/W Spec
인터페이스	iSCSI, NFS
네트워크	8Gb FC/10GigE
필요 볼륨	8 TB

* VMWare Enterprise license 보유 시 Cluster 내의 자원을 Resource Pool로 격리시켜 사용할 수 있습니다.

G 시스템 DR 구성

안정적인 서비스 운영을 위해 GTM(Global Transaction Manager)을 외부 망에 배치하여 IDC간 이중화





PCF 특장점

Speed Thrills



Adib Saikali
@AdibSaikali

Follow

@scotiabank scaled to 29 teams in 4 countries 3000+ deploys/month in 10 month with @pivotalcf transforming a 185 year old bank. #SpringOne



10:26 AM - 6 Dec 2017



Nate Schutta
@ntschutta

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I'll say it again - yes "your" company in "your" industry can adapt and change. You too can go from releases in 14 months to 14 days like @markardito at @HCSC #springone



9:22 AM - 7 Dec 2017



Dorman Drewitz
@DormanDrewitz

Follow

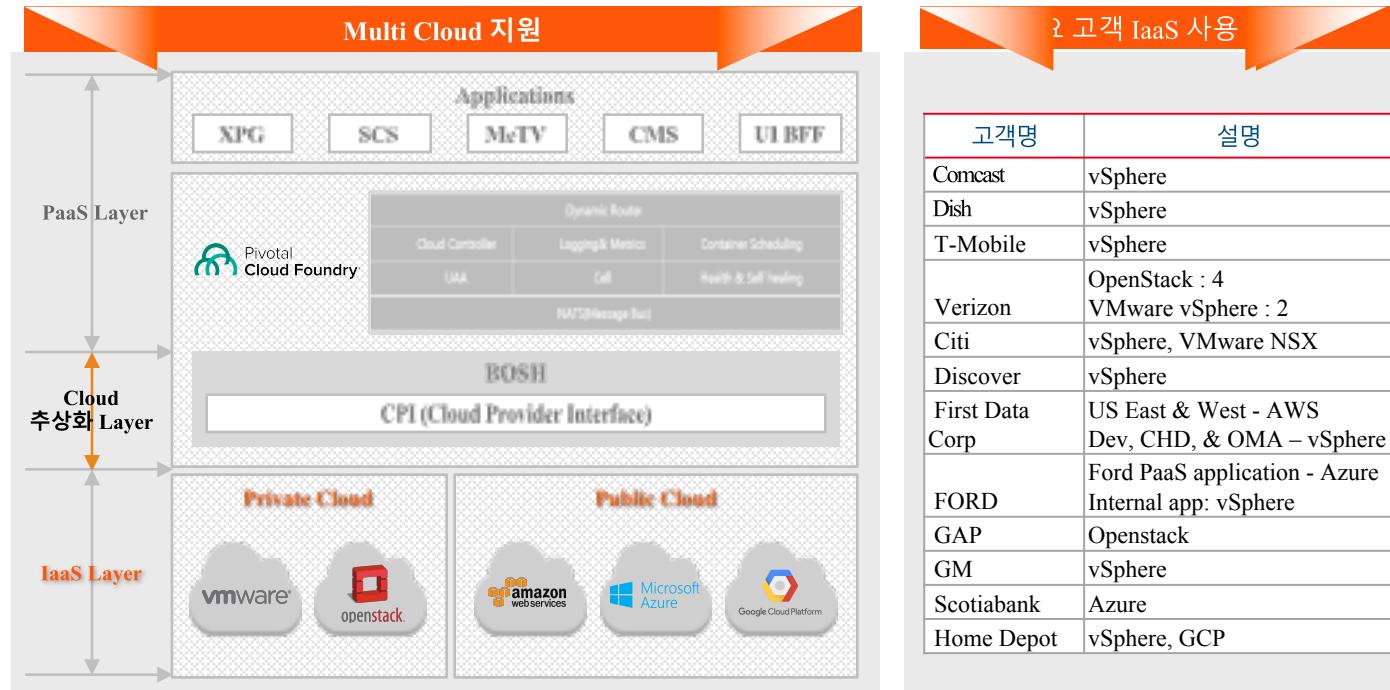
6x increase in asset utilization at @Boeing. Oh and MVPs in 3-5 months, down from 1-3 years.
#SpringOne



9:27 AM - 7 Dec 2017

Multi-Cloud 지원

PCF는 **Multi-Cloud를 지원**해 IaaS를 변경하여도 **Application의 수정없이 바로 사용**이 가능합니다.



Cloud Foundry BOSH

BOSH 분산 환경에서의 릴리즈
엔지지어링, 배포, 라이프사이클 관리
및 모니터링을 위한 오픈소스 툴



mark lucovsky
@marklucovsky

Follow



BOSH: Designed and built by [@vadimspivak](#) and [@skaar](#), influenced by Google's borg.
BOSH == borg++ (r+1=s, g+1=h).

Cloud Foundry  @cloudfoundry

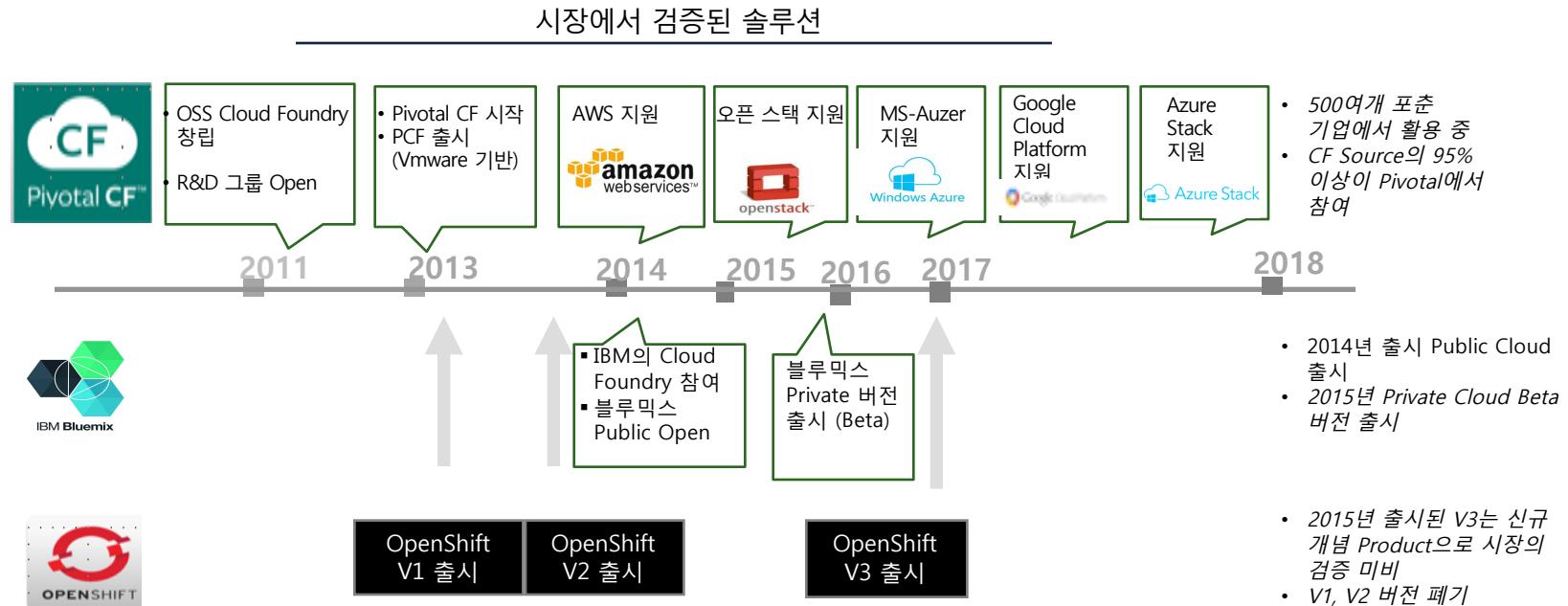
BOSH is the powerful orchestration tool that lies at the heart of #CloudFoundry.
ow.ly/4ne4iU

- 임베디드 OS 탑재 패키징
- 모든 IaaS 상의 서버 프로비저닝
- 클러스터간 소프트웨어 배포
- 서버 및 프로세스, 서비스상태 모니터링
- Resurrector를 이용한 자기 치유 기능
- 스토리지 관리
- 카나리를 통한 롤링 업그레이드
- 클러스터의 손쉬운 확장

11:11 PM - 7 May 2016

플랫폼 로드맵 안정성

PCF는 2013년부터 시장에 출시되어 현재 Global Fortune 500대 Pivotal 고객에서 실제 운영용으로 활용하고 있는 시장에서 검증된 솔루션



서비스 연속성을 보장 – 4-LEVEL HA

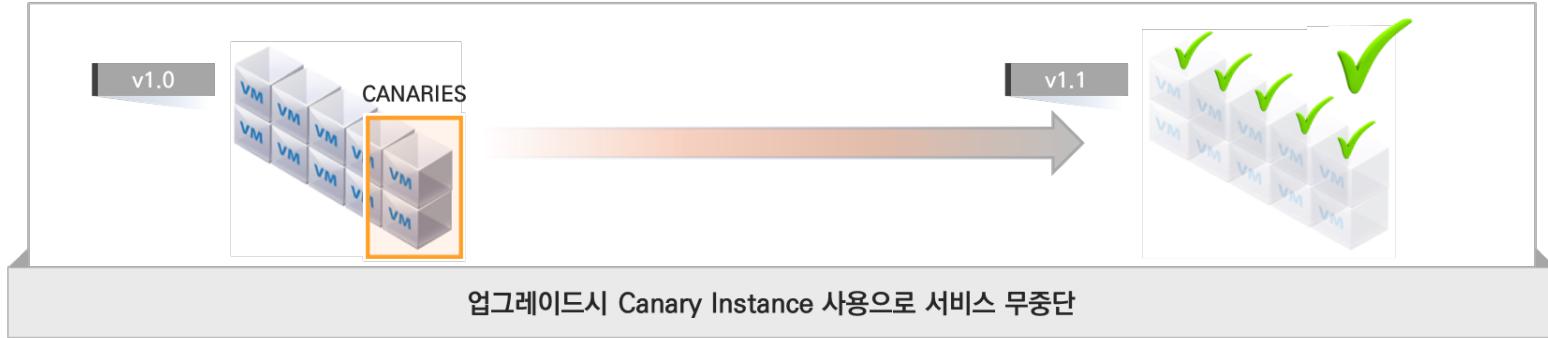
PCF는 장애 발생 상황에 대비하여 4레벨의 고 가용성 아키텍처를 기반으로 자동 감지/복구되어 서비스 연속성을 보장



무 중단 플랫폼 Patch/Upgrade

PCF는 장애 발생 상황에 대비하여 4레벨의 고 가용성 아키텍처를 기반으로 자동 감지/복구되어
서비스 연속성을 보장

“**Continuous Delivery(무중단 Atomic Rolling Update)**”



무중단 플랫폼 확장

PCF를 운영중인 On-Premise VMWare Host 용량이 부족한 경우, Cluster에 신규 Host를 중단 없이 추가할 수 있고, PCF 플랫폼 운영자 도구(Ops Manager)에서 **무중단 확장**

VMware Cluster Host 추가

The diagram shows a VMware cluster consisting of three hosts: VMware EXSi, VMware EXS, and another VMware EXSi. Virtual machines (VMs) are shown moving between hosts via vMotion. Below the hosts is a 'Cluster' box, which is connected to a 'VMware cluster' represented by a stack of server racks. At the bottom, there's a screenshot of the 'vmware vSphere Web Client' showing the 'Production' tab. In the 'Actions' menu, the 'Add Host...' option is highlighted with a red arrow.

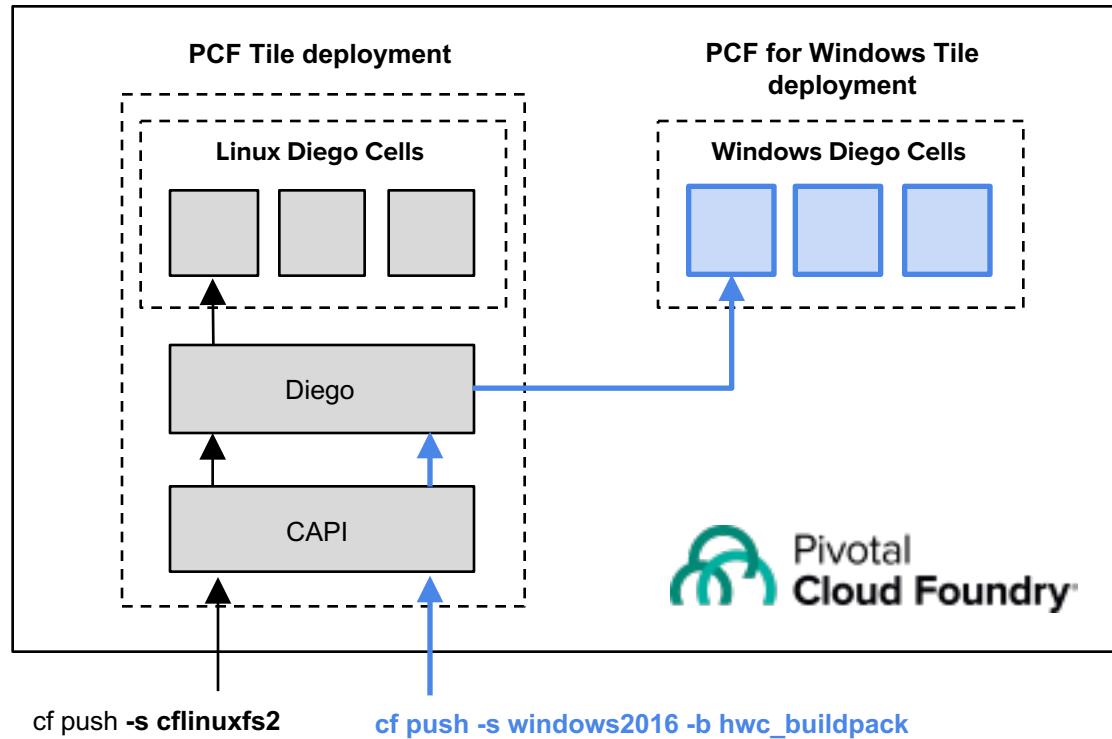
운영자 도구에서 무중단 Scaling

The screenshot shows the Pivotal Ops Manager interface. On the left, there's a sidebar with links like 'Pivotal CF', 'Dynamic Router', 'Cloud Controller', 'Link', 'SEA Pool', 'App', 'Messaging (AMQP)', 'Metrics Collection', 'Log Aggregation', and 'Elastic Runtime'. The main area displays a grid of service instances for various providers. Each instance has a dropdown menu for scaling options. Examples include 'MySQL for Pivotal CF', 'MongoDB for Pivotal CF', 'Cassandra for Pivotal CF', 'Elasticsearch for Pivotal CF', 'Mobile Services for Pivotal CF', and 'Pivotal Spring Insight'.

- PCF Platform 구성하는 VM Capacity 재조정
- VM의 Instance, vCPU, Memory, Disk 조정 시 서비스 연속성 보장

단일 플랫폼에서 LINUX/Windows 지원

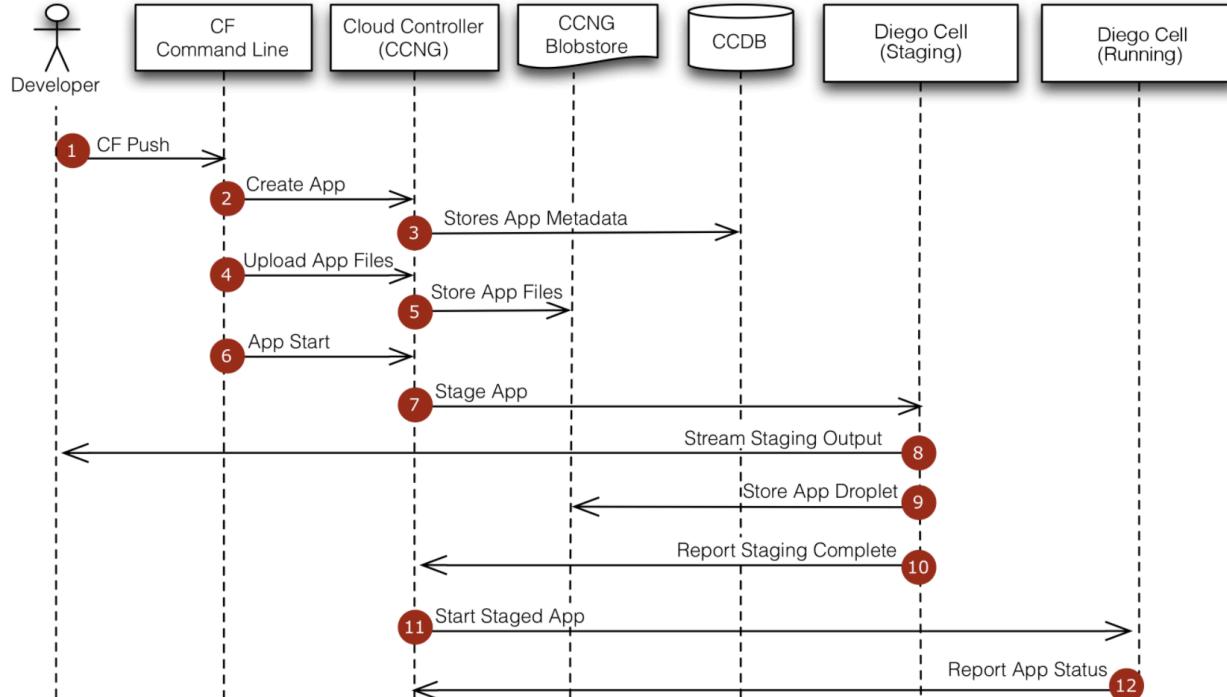
PCF는 Native .NET 애플리케이션을 단일 플랫폼에서 지원하여, JAVA 및 .Net 앱을 수용할 수 있음



Language Service: 다양한 개발 언어 지원



cf push: 개발자 및 운영자의 워크플로우 자동화



- 코드 업로드
- 필요한 런타임 및 미들웨어("Buildpacks")를 감지하고 설치
- 라우터 (or URL) 설정
- 로드밸런서 항목 생성
- SSL 생성
- 상태 모니터링 및 로깅 하위 시스템 생성
- 원하는 인스턴스 개수로 건강한 상태의 앱 구동
- 지정된 백엔드 서비스 연결



Spring Boot 실행을 위한 최적의 플랫폼

- SpringBoot와 PCF의 만남은 개발 팀의 생산성 극대화



Spring Boot

- 간편한 의존성 관리
- 앱서버 내장
- “그냥 실행”만 하면 되는 자체 내장된 앱 생성



Pivotal Application Service

- jar로 컨테이너 생성
- “cf push”로 컨테이너에서 앱을 즉시 구동
- 환경 프로퍼티 추가

マイクロサービス 구축 및 운영 환경 제공



Config Server for PCF

Delivers a dynamic, central configuration service to manage an application's external properties across all environments.



Service Registry for PCF

Provides an implementation of the NetflixOSS Eureka Service Discovery pattern, as a service.



Circuit Breaker Dashboard for PCF

Visualizes a stream of Turbine health and metric data from the circuit breakers inside your microservices or applications.

온 디멘드 데이터 서비스 제공



MySQL for PCF

- Enterprise-ready MySQL for your developers
- Automate database operations in developer workflows
- **NEW:** Leader-follower for multi-site HA



Pivotal Cloud Cache

- High performance, in-memory, data at scale for microservices
Look-aside caches & HTTP session state caching
- **NEW:** WAN replication



RabbitMQ for PCF

- Easily connect distributed applications with the most widely deployed open source message broker
- Enable connected scalable, distributed applications
- **NEW:** On-demand clusters



Redis for PCF

- In-Memory cache and datastore, configured for the enterprise
- Efficient provisioning matched to use cases

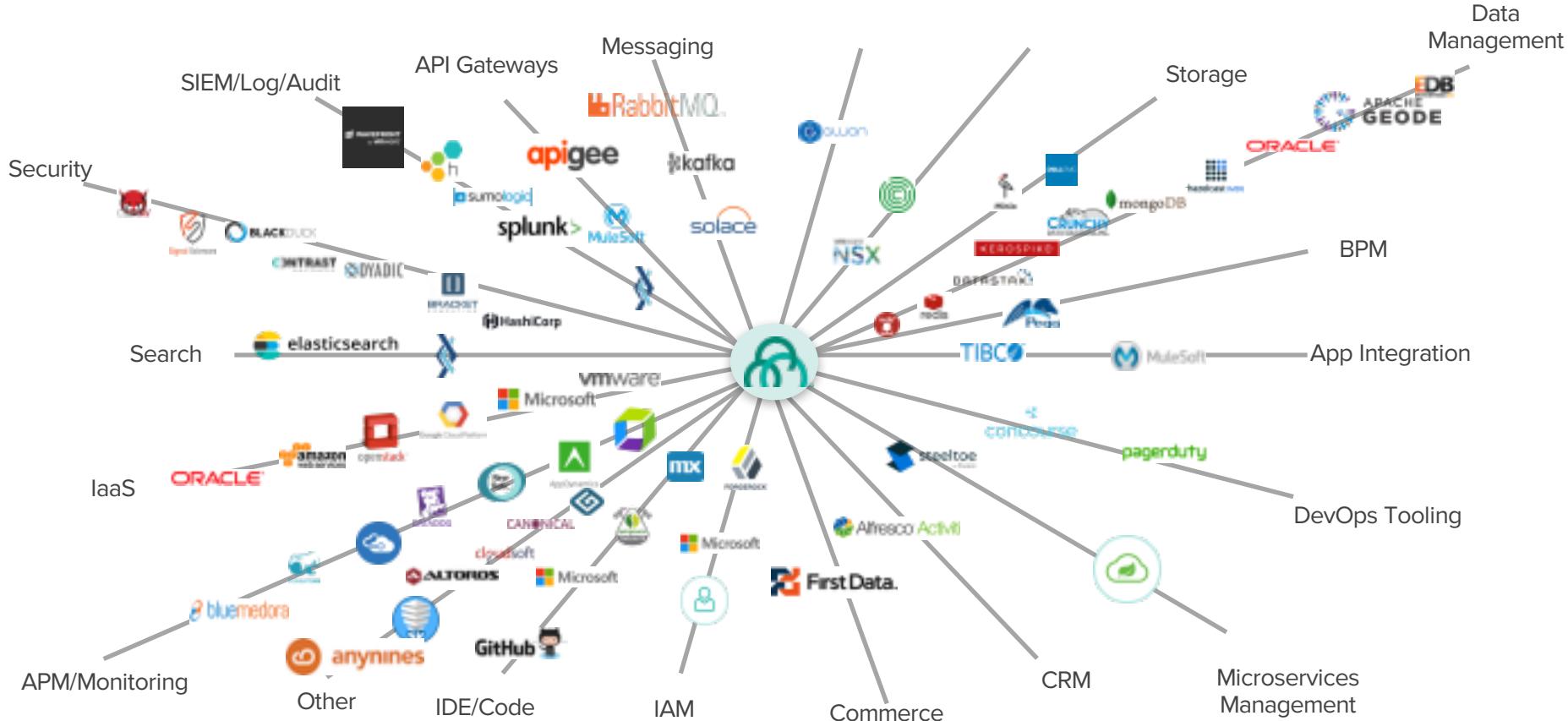
BOSH 관리

주문형 프로비저닝

할당된 인스턴스

커스텀 서비스 플랜

Marketplace: 다양한 3rd Party 서비스 활용



A photograph of a workshop or classroom environment. On the left, a man in a grey t-shirt and shorts stands writing on a whiteboard with a marker. In the center, three people are seated at a table, looking towards the right. On the right, a man with a beard and a light-colored shirt stands with his arms crossed, looking towards the center. The room has exposed pipes and a large window in the background.

LAB #2: Django App

A photograph of a workshop or classroom environment. In the foreground, a man stands on the left, writing on a whiteboard with a marker. On the right, another man with a beard stands with his arms crossed, looking towards the center. In the middle ground, three people are seated at a table, looking towards the left. The background shows shelves and other people in the distance.

LAB #3: PCF Basic Demo



Transforming How The World Builds Software